ASTRONOMY

Brilliant Planets Visible

Venus and Jupiter form an exceptional display in the southwest on February evenings. Partial eclipse of moon scheduled for the 13th is the second eclipse so far this year.

By JAMES STOKLEY

➤ ANY YEAR at this time, the brilliant constellations visible in the evening sky, particularly toward the southwest, afford about the finest display the heavens have to offer.

In February, 1953, they are made even more glorious by the addition of the two brightest planets, both exceeding in brilliance any of the surrounding stars.

The positions of these stars and planets on February evenings are shown on the accompanying maps. These give the appearance of the skies at about ten o'clock, your own kind of standard time, on the evening of the first; about nine on the 15th, and eight on the 28th.

Most brilliant of all is the planet Venus, which can be seen low in the west even while dusk is gathering and long before any star comes out. It is in the constellation of Pisces, the fishes. On the astronomer's brightness scale it is now of magnitude minus 4.2.

Soon after dusk Jupiter, in Aries, the ram, can be seen high in the south. Though only about a ninth as bright as Venus, Jupiter is still very prominent.

Sirius Is Brightest Star

The planets, of course, shine by reflected sunlight, while the stars are distant suns, glowing themselves. The brightest star now seen is Sirius, otherwise known as the dog-star, in Canis Major, the great dog, visible in the south.

Above and to the right of this group is magnificent Orion, which can be recognized by the three stars in a row that form the warrior's belt. Above these is first-magnitude Betelgeuse, and below we find Riegel, also of the first magnitude.

Five other stars of similar brightness can also be seen. Almost overhead is Capella, in Auriga, the charioteer. To the southeast of this are Gemini, the twins, with Pollux as the brightest star. Just below is Canis Minor, the lesser dog, with the star called Procyon. To the right of this we pass Orion, and then come to Taurus, the bull, in which Aldebaran shines, marking the bull's eye.

The remaining first-magnitude star is in another part of the sky, toward the east, in Leo, the lion. This is Regulus, part of a subgroup of the constellation known as the sickle. Regulus is at the end of the handle of this implement.

February brings the year's second eclipse when, on the 13th, the moon partly comes in front of the sun. However, it is not visible from the United States or Canada, though it will be seen as the sun is setting in Alaska. Also, it will be visible from eastern Siberia, China, Japan and Korea.

The greatest eclipse will occur at a point near the town of Strelka, in the Siberian province of Krasnoyarsk. Here, just as the sun is rising, about three-fourths of the sun's diameter will be covered by the dark disk of the moon. People in Nome, Alaska, will see about a quarter of the solar diameter hidden shortly before sunset.

Eclipses of Algol

Another type of eclipse can be seen much more frequently. This is of the star called Algol in the constellation of Perseus, seen high in the northwest.

Ordinarily of the second magnitude, in a period of a little less than three days it fades to less than a third of its former brightness, taking about five hours to dim and five more before restoration to its normal magnitude. The times of some of these minima of Algol are given in the "Celestial Time Table" at the end of this article.

Although an Italian astronomer named Montanari is credited with the discovery of the variability of this star in November, 1670, even earlier its peculiar character may have been noted.

The name Algol is a corruption of the older name given it by the Arabs, "Al Ghul," which means "the demon," and it is surmised that they had recognized its variability. Indeed it seems to have had an unsavory character among others as well, for the Hebrews are said to have named it "Satan's head," while the Chinese knew it as "piled-up corpses."

Modern astronomical observations of it have been made, some with the aid of the spectroscope, which not only tells us what a star is made of but also whether it moves toward or away from us, and how fast.

These observations have revealed that this star is not a single orb, like the sun, but consists of two separate bodies, revolving around the center of gravity of the pair, somewhere between them. This is not an unusual condition, for a large proportion of all the stars in the sky are such binaries.

In the case of Algol, however, it happens that one of the stars is very much brighter than the other; also that the solar system is nearly in the plane in which they revolve. The result is that once in every revolution the dark one comes in front of the bright one, producing a partial eclipse, with the decrease in brightness that is observed every few days.

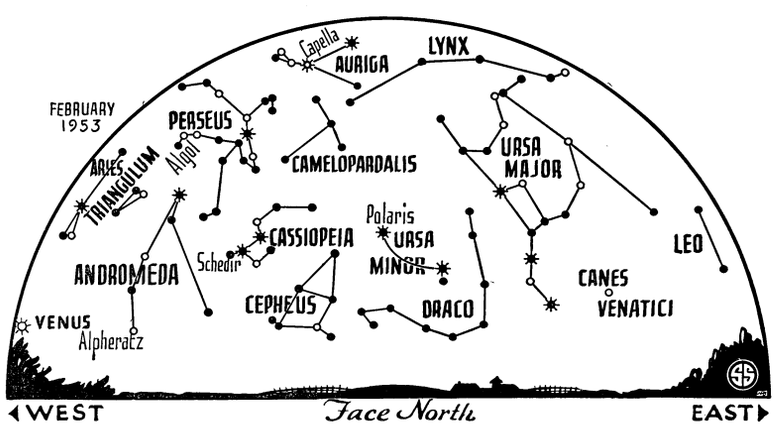
Moreover, an accurate measurement of its light shows that half way between this major diminution in brilliance there is another but not nearly as great. This happens when the bright one hides the faint one, and shows that the latter is not completely dark.

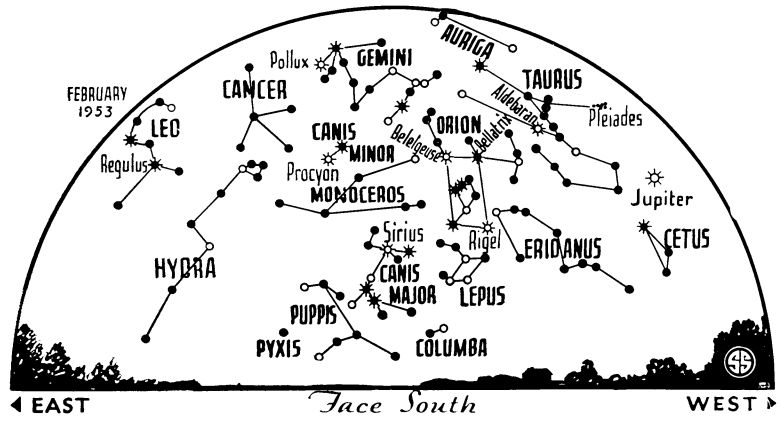
System Has Four Stars

Astronomers have studied Algol, and have learned many facts about this strange system, which is made complex by the fact that, in addition to the two main stars, there are also a third and a fourth. The innermost of these faint companions goes around the pair in a year and three-quarters, and the outermost in 188 years.

They have learned the dimensions of the two stars that undergo eclipse, and that they are separated by about 6,500,000 miles. The bright star has a surface temperature of some 22,000 degrees Fahrenheit, about twice as hot as the sun, and a diameter of about 2,700,000 miles, about three times the sun's.

The fainter star is much cooler than the sun, with a temperature at its surface of





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

5,400 degrees Fahrenheit. It is the larger of the pair, about 3,000,000 miles in diameter, or three and a half times that of the sun.

Strange though it may seem, the structure of the Algol system is quite orthodox compared to another pair in Taurus, known as RW Tauri. From studies of its variations in light, and the peculiar alterations in its spectrum that occur simultaneously, astronomers have concluded that one member of the pair is a brilliant white star. The other is a fainter body, yellow in color and about twice the diameter.

The most peculiar feature, however, is that around the smaller white star there is a ring of glowing hydrogen gas, something like the ring around Saturn. Just before and just after the total eclipse of the white star by the large yellow one, there is a period when one or the other side of the ring may be observed by itself.

This produces a change in the spectrum of its light, enabling astronomers to deduce that it revolves around the white star at 217 miles per second.

Celestial Time Table for February

Feb.	EST	
1	7:00 a.m.	Moon farthest, distance 252,300 miles.
5	12:52 p.m.	Moon passes Saturn.
6	11:09 p.m.	Moon in last quarter.
10	2:18 a.m.	Algol at minimum.
	8:01 p.m.	Pluto nearest, distance 3,214,160,000 miles.
12	11:12 p.m.	Algol at minimum.
13	8:10 p.m.	New moon, partial eclipse of sun.
14	5:00 a.m.	Moon nearest, distance 221,890 miles.
16	5:41 p.m.	Moon passes Mars.
	8:00 p.m.	Algol at minimum.
17	3:51 a.m.	Moon passes Venus.
18	4:48 p.m.	Algol at minimum.
19	8:45 a.m.	Moon passes Jupiter.
20	12:44 p.m.	Moon in first quarter.
28	9:00 a.m.	Moon farthest, distance 252,450 miles.
	1:59 p.m.	Full moon.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, January 31, 1953

SURGERY

New Pain-Killing Method

➤ THE SEVERE pain of six patients hopelessly sick with cancer of the head and neck has been relieved by a method developed at the University of Pennsylvania Hospital.

The method consists in injecting novocaine into the frontal lobe of the brain. It was developed by Drs. Francis C. Grant and Frank E. Nulsen under a grant from the American Cancer Society.

In all cases so far, pain was completely controlled, and the patients were left in command of their mental and physical faculties until their deaths as long as nine weeks after injection. Only patients with short life expectancies were so treated.

The operation is minor. It consists in making two small openings on either side of the skull at the forehead hairline. Local anesthetics are used for this. The novocaine, which the dentist uses to "freeze" tooth nerves, then is injected into the frontal lobe of the brain. Patients not physically disabled by their cancers or requiring hospital care return home after seven to ten days of hospitalization.

Later injections can be given at the patient's bedside with no more discomfort than that involved in a routine intravenous injection of glucose.

Drs. Nulsen and Grant obtained their idea from observations made by Dr. W. P. van Wagenen of the University of Rochester, New York.

Dr. van Wagenen injected small amounts of novocaine into the frontal lobe of psychiatric patients as a forecast of their response to surgical lobotomy. He found that, generally, those who responded favorably to novocaine for a few hours would benefit from lobotomy. About 60% of the patients reacted well and underwent operation.

Science News Letter, January 31, 1953

METEOROLOGY

Need Wind Forecasts More Than Pollen Counts

➤ HAY FEVER sufferers will profit more from a forecast of wind speed and direction than from local "pollen counts," says Prof. Nelson Dingle, meteorologist with the Ohio State University.

Pollen counts work on the assumption that pollen is evenly dispersed over a large area, Prof. Dingle said. But actually, it is absolutely impossible to find uniform dispersion of particles the size of pollen grains in large open areas, he said.

Because of sudden gusts of wind, pollen counts may change quite drastically from one point to another only a short distance apart, making the counts clinically useless, Prof. Dingle said. His report was made in *Science* (Jan. 16).

Science News Letter, January 31, 1953

EMBRYOLOGY

Study Embryos With "Hot" Carbon Dioxide

➤ RADIOACTIVE CARBON dioxide is being used as a new tool to study the origin and development of certain organ rudiments in the embryo. The study is being performed by Dr. Reed A. Flickinger, University of California at Los Angeles embryologist.

The investigation involves diffusion of radioactive carbon dioxide through the membranes of frog eggs. In this manner carbon compounds in the embryo are tagged so that their activity can be traced.

The study is particularly aimed at the tissue layers from which the organ systems evolve. Present research is concerned with analyzing the stimulus necessary for formation of the nervous system. It is suspected that the contact of tissue layers and a relationship between the life processes of the layers may be the key to this stimulus.

By tracing the activity of components of the tissues, made radioactive by contact with the radioactive gas, it is hoped some clue may be gained to the method by which such complex systems are fashioned from undifferentiated layers of tissue.

Science News Letter, January 31, 1953